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Guided by the Light: Neutrophil Migration through Zebrafish

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The second sentence in the first issue of *Developmental Cell* states that the new journal's goal is to provide "a unique resource for scientists interested in the properties of individual cells and their regulation in a larger multicellular context." The paper by Yoo, Huttenlocher, and colleagues illustrates this credo beautifully. Using live imaging, the authors analyzed how individual neutrophils navigate through the zebrafish embryo. Most strikingly, local activation of a photoactivatable form of Rac induced membrane protrusions and directed migration. PI(3)K inhibition abolished light-guided migration, suggesting that PI(3)K does not act exclusively through Rac. The paper not only provides an elegant test of the roles of Rac and PI(3)K during migration but also highlights the power of optogenetic technologies in analyzing and manipulating cells during development. Or, as stated in the very first issue, "The field is flourishing, and new tools are opening up avenues of investigation that would have seemed daunting if not unattainable a few years ago." This PaperPick refers to "Differential Regulation of Protrusion and Polarity by PI(3)K during Neutrophil Motility in Live Zebrafish" by Sa Kan Yoo, Qing Deng, Peter J. Cavnar, Yi I. Wu, Klaus M. Hahn, and Anna Huttenlocher, published in February, 2010.